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EXAMINER

LOVEL, KIMBERLY M

ART UNIT PAPER NUMBER

2167

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. 10/754,011	Applicant(s) DAY ET AL.	
Examiner Kimberly Lovel	Art Unit 2167	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 08 January 2004.
- 2a) This action is **FINAL**.
- 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-24 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-24 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 8 January 2004 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____

DETAILED ACTION

1. Claims 1-24 are rejected.

Claim Objections

2. Claims 1, 3, 7, 8 and 15 are objected to because of the following informalities:

Claim 1, line 3 recites "query; the method comprising." It is suggested that the semicolon be replaced by a comma.

Claim 3 recites the limitation "the determining step" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 7 recites the limitation "the one table" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 8 recites the limitation "the table" in line 1. It is unclear which table this limitation refers to since claim 1 refers to a plurality of tables.

Claim 15 recites "claim 13; further" in line 1. It is suggested that the semicolon be either deleted or replaced by a comma. Also, line 2 of claim 15 recites "according to a join order, the join ordered determined." It is suggested that "ordered" be changed to "order" so that the claim recites "according to a join order, the join order determined."

Appropriate correction is required.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

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Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 20-23 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 20 and 22 claim a program product comprising a signal bearing medium bearing the program code. A signal is considered to be nonstatutory subject matter because it does not fall into any of the four statutory categories of invention. This is consistent with teachings of Annex IV of the "Interim Guidelines for Examination of Patent Applications for Subject Matter Eligibility" that was signed on Oct 26 and posted at

<http://www.uspto.gov/web/offices/pac/dapp/ogsheet.html> . Claims 21 and 23, which are dependent respectively on claims 20 and 22 fail to overcome the rejection and therefore are rejected on the same grounds as claims 20 and 22.

To expedite a complete examination of the instant application, the claims rejected under 35 U.S.C. 101 (nonstatutory) above are further rejected as set forth below in anticipation of applicant amending these claims to place them within the four statutory categories of invention.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which

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said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-6, 9-15 and 18-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No 5,875,447 to Goel et al (hereafter Goel et al) in view of US Patent No 6,757,677 to Pham et al (hereafter Pham et al).

Referring to claim 1, Goel et al discloses a method for optimizing a database query, the database query including criteria that references a plurality of tables in order to re-order a result set generated for the database query (see abstract); the method comprising the steps of: applying transitive closure analysis to the query (see column 3, lines 26-30). However, Goel et al fail to explicitly teach the further limitation of based on the transitive closure analysis, rewriting the criteria to generate modified criteria to reduce the number of tables referenced thereby. Pham et al disclose an optimizer that is able to consider group-by operations as part of the optimization of a join (see abstract) including the further limitation of based on the transitive closure analysis, rewriting the

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criteria to generate modified criteria to reduce the number of tables referenced thereby (see column 2, lines 35-48 and column 9, lines 9-13 – the where clause is considered to represent the transient closure).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Pham et al's optimizer with the method for the reordering of complex SQL queries involving group-bys and joins. One would have been motivated to do so in order to improve efficiency concerning the processing of complex SQL queries that contain Group-bys (Goel et al: see column 3, lines 17-19).

Referring to claim 2, the combination of Goel et al and Pham et al (hereafter Goel/Pham) discloses the method according to claim 1, wherein the criteria is one of a GROUP BY clause and an ORDER BY clause (Pham et al: see column 3, lines 9-13 – group by clause).

Referring to claim 3, Goel/Pham discloses the method according to claim 1, wherein the determining step further comprises the step of: determining if the criteria references a first field from a first table and a second field from a second table (Pham et al: see column 3, lines 30-50 – x1 is considered to represent the first field from the first table; y3 is considered to represent the second field from a second table).

Referring to claim 4, Goel/Pham discloses the method according to claim 3, wherein the rewriting step comprises the step of: rewriting the criteria to reference the first field and a third field from the first table (Pham et al: see column 5, lines 47-65).

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Referring to claim 5, Goel/Pham discloses the method according to claim 1, further comprising the step of: determining if the criteria references a plurality of tables (Pham et al: see column 4, line 58 – column 5, line 13).

Referring to claim 6, Goel/Pham discloses the method according to claim 1, wherein the step of rewriting further includes the step of: rewriting the criteria to generate modified criteria that references only one table, based on the transitive closure analysis (Pham et al: see column 1, lines 50-65).

Referring to claim 9, Goel/Pham discloses the method according to claim 1, wherein the database query involves a plurality of join operations and the method further comprises the step of: running the query according to a join order that is based on the modified criteria (Pham et al: see column 6, lines 46-54).

Referring to claim 10, Goel et al discloses A method of optimizing a database query, the database query including criteria that operates to re-order a result set of the database query and requires creating a temporary file during operation (see abstract); the method comprising the steps of: applying transitive closure analysis to the query (see column 3, lines 26-30). However, Goel et al fail to explicitly teach the further limitations of based on the transitive closure analysis, rewriting the criteria to generate modified criteria to reduce the number of tables referenced thereby and said modified criteria operating to re-order a result set of the database query and avoid creating a temporary file during operation. Pham et al disclose an optimizer that is able to consider group-by operations as part of the optimization of a join (see abstract) including the further limitations of rewriting the criteria, based on the transitive closure analysis, to

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generate a modified criteria (see column 2, lines 35-48 and column 9, lines 9-13 – the where clause is considered to represent the transient closure); said modified criteria operating to re-order a result set of the database query and avoid creating a temporary file during operation (see column 6, lines 46-65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Pham et al's optimizer with the method for the reordering of complex SQL queries involving group-bys and joins. One would have been motivated to do so in order to improve efficiency concerning the processing of complex SQL queries that contain Group-bys (Goel et al: see column 3, lines 17-19).

Referring to claim 11, Goel/Pham discloses the method according to claim 10, wherein the criteria is one of a GROUP BY clause and an ORDER BY clause (Pham et al: see column 3, lines 9-13 – group by clause).

Referring to claim 12, Goel/Pham discloses the method according to claim 10, wherein the criteria references a plurality of tables (Pham et al: see column 4, line 58 – column 5, line 13) and the modified criteria references a single table (Pham et al: see column 1, lines 50-65).

Referring to claim 13, Goel et al discloses a method for optimizing a database query, the database query involving a plurality of join operations and a plurality of search conditions, (see abstract); the method comprising the steps of: applying transitive closure analysis to the plurality of search conditions to determine a subset of equivalent search fields (see column 3, lines 26-30). However, Goel et al fail to explicitly teach the further limitation of rewriting a

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criteria, that operates to re-order a result set of the database query, to generate a set of respective modified criteria that each reference one or more equivalent search fields. Pham et al disclose an optimizer that is able to consider group-by operations as part of the optimization of a join (see abstract) including the further limitation rewriting a criteria, that operates to re-order a result set of the database query, to generate a set of respective modified criteria that each reference one or more equivalent search fields (see column 2, lines 35-48 and column 9, lines 9-13 – the where clause is considered to represent the transient closure).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Pham et al's optimizer with the method for the reordering of complex SQL queries involving group-bys and joins. One would have been motivated to do so in order to improve efficiency concerning the processing of complex SQL queries that contain Group-bys (Goel et al: see column 3, lines 17-19).

Referring to claim 14, Goel/Pham discloses the method according to claim 13, wherein the modified criteria comprises one of an ORDER BY clause and a GROUP BY clause (Pham et al: see column 3, lines 9-13 – Group-by clause).

Referring to claim 15, Goel/Pham discloses the method according to claim 13; further comprising the step of: running the query according to a join order, the join ordered determined by selecting one of the set of respective modified criteria (Pham et al: see column 14, lines 42-61).

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Referring to claim 18, Goel/Pham discloses the method according to claim 13, further comprising the step of: running the query according to a join order, the join order determined by selecting one of the subset of respective modified criteria (Pham et al: see column 13, line 41 – column 14, line 18).

Referring to claim 19, Goel/Pham discloses method according to claim 13, further comprising the steps of:

performing cost analysis on each of the set of respective modified criteria (Goel et al: see column 15, lines 20-25); and

running the query according to a join order, the join order determined based on the cost analysis (Goel et al: see column 15, lines 20-25).

Referring to claim 20, Goel/Pham discloses a program product comprising a signal bearing medium bearing the program code (Goel et al: see column 8, lines 59-64). Therefore, the program product of claim 20 is rejected on the same grounds as the method of claim 1.

Referring to claim 21, Goel/Pham discloses the program product of claim 20, wherein the program code is further configured to: run the query according to a join order that is based on the modified criteria (Pham et al: see column 6, line 46-54 – modifying the group-by clause).

Referring to claim 22, Goel/Pham discloses a program product comprising a signal bearing medium bearing the program code (Goel et al: see column 8, lines 59-64). Therefore, the program product of claim 22 is rejected on the same grounds as the method of claim 13.

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Referring to claim 23, Goel/Pham discloses the program product of claim 22, wherein the program code is further configured to: run the query according to a join order that is based on the modified criteria (Pham et al: see column 6, line 46-54 – modifying the group-by clause).

Referring to claim 24, Goel/Pham discloses an apparatus comprising a processor (Pham et al: see column 16, lines 57-60) coupled to a memory (Pham et al: see column 16, lines 53-57 – storage unit). Therefore, the apparatus of claim 24 is rejected on the same grounds as the method of claim 1.

7. Claims 7-8 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No 5,875,447 to Goel et al (hereafter Goel et al) in view of US Patent No 6,757,677 to Pham et al as applied respectively to claims 1 and 13 above, and further in view of US Patent No 5,598,559 to Chaudhuri.

Referring to claim 7, Goel/Pham discloses a method for optimizing a database query. However, Goel/Pham fails to explicitly disclose the further limitation of building an index over a column of the one table. Chaudhuri discloses a method for optimizing queries having group-by operations (see abstract), including the further limitation of building an index over a column of the one table (see column 7, line 55 – column 8, line 26).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Chaudhuri's step of indexing the tables as a subcomponent to the method for the reordering of complex SQL queries involving group-bys and joins. One would have been motivated to do so in order

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to improve efficiency concerning the processing of complex SQL queries that contain Group-bys (Goel et al: see column 3, lines 17-19).

Referring to claim 8, Goel/Pham discloses a method for optimizing a database query. However, Goel/Pham fails to explicitly disclose the further limitation of building an index over more than one column of the one table. Chaudhuri discloses a method for optimizing queries having group-by operations (see abstract), including the further limitation of building an index over more than one column of the one table (see column 7, line 55 – column 8, line 26).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Chaudhuri's step of indexing the tables as a subcomponent to the method for the reordering of complex SQL queries involving group-bys and joins. One would have been motivated to do so in order to improve efficiency concerning the processing of complex SQL queries that contain Group-bys (Goel et al: see column 3, lines 17-19).

Referring to claim 16, Goel/Pham discloses a method for optimizing a database query. However, Goel/Pham fails to explicitly disclose the further limitation of identifying a subset of the respective modified criteria that reference a single, respective table and for which an index to that table exists. Chaudhuri discloses a method for optimizing queries having group-by operations (see abstract), including the further limitation of identifying a subset of the respective modified criteria that reference a single, respective table and for which an index to that table exists (see column 4, line 60 – column 5, line 25 and column 7, line 55 – column 8, line 26).

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Chaudhuri's step of identifying subsets as a subcomponent to the method for the reordering of complex SQL queries involving group-bys and joins. One would have been motivated to do so in order to improve efficiency concerning the processing of complex SQL queries that contain Group-bys (Goel et al: see column 3, lines 17-19).

Referring to claim 17, Goel/Pham discloses a method for optimizing a database query. However, Goel/Pham fails to explicitly disclose the further limitation of identifying a subset of the respective modified criteria that reference a single, respective table and for which an index is to be created. Chaudhuri discloses a method for optimizing queries having group-by operations (see abstract), including the further limitation of identifying a subset of the respective modified criteria that reference a single, respective table and for which an index is to be created (see column 4, line 60 – column 5, line 25 and column 7, line 55 – column 8, line 26).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Chaudhuri's step of identifying subsets as a subcomponent to the method for the reordering of complex SQL queries involving group-bys and joins. One would have been motivated to do so in order to improve efficiency concerning the processing of complex SQL queries that contain Group-bys (Goel et al: see column 3, lines 17-19).

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Contact Information


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimberly Lovel whose telephone number is (571) 272-2750. The examiner can normally be reached on 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Cottingham can be reached on (571) 272-7079. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kimberly Lovel
Examiner
Art Unit 2167

kml
5 July 2006


Primary Examiner
Art Unit 2167